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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,889	09/19/2003	Daniel J. Gregoire	HRL025-DIV	6992
28848 7590 08/10/2007 TOPE-MCKAY & ASSOCIATES 23852 PACIFIC COAST HIGHWAY #311 MALIBU, CA 90265			EXAMINER BUEKER, RICHARD R	
			ART UNIT 1763	PAPER NUMBER
			MAIL DATE 08/10/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/665,889	<b>Applicant(s)</b> GREGOIRE ET AL.	
	<b>Examiner</b> Richard Bueker	<b>Art Unit</b> 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                 | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____  |

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4-8 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leung I (5,198,677) taken in view of Kaufman (4,481,062) and Leung II (5,587,226) and taken in further view of Collins (6,545,420) or Brailove (6,016,036). Leung I (5,198,677) discloses an ion source (Fig. 1) including a plasma generating chamber, magnets arranged around the chamber, a tungsten filament that is heated by a filament power source, a gas port, a bias DC power source, and an array of magnets at the exit of the chamber that act as a magnetic filter of the type claimed by applicants. Leung I teaches that his magnetic filter design desirably produces a stream of mainly atomic ions. Leung's ion source also includes a cooling channel formed between a plasma generation chamber and a cylindrical wall for cooling magnets in the channel; and a liner made of a high-temperature resistant material such as molybdenum provided within the chamber (column 3, line 10 through column 4, line 10). Leung I uses a DC power source 58 to heat the tungsten filament and does not discuss the use of an AC power source to heat his tungsten filament. Also, Leung I does not discuss using his ion source to generate atomic oxygen ions. Kaufman (see Fig. 1 and col. 5, lines 1-6) teaches that either an AC or DC power source can be used to heat a tungsten filament to thermionic temperatures. It would have been prima facie obvious to one skilled in the art to modify the ion source of Leung I (5,198,677) by substituting an AC

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power source for Leung's DC power source 58, because Kaufman teaches that an AC power source was known to be a functional equivalent power source for heating a tungsten filament to thermionic temperatures. Regarding the production of atomic oxygen ions, Leung II (5,587,226) teaches (see the entire patent and in particular col. 13, lines 7-29 and col. 15, lines 13-41) that it is desirable to produce a stream of atomic oxygen ions for materials processing, and Leung II (5,587,226) also teaches that a magnetic filter of the type used by Leung I will produce such a stream of atomic oxygen ions. Therefore, it would have been obvious to one skilled in the art to use the atomic ion source of Leung I (5,198,677) to produce the desired atomic oxygen ions by providing the Lueng I ion source with a source of oxygen as presently claimed. Leung II also teaches (see col. 15, lines 15-41) that his antenna ion source is more desirable for oxygen ion production than a DC discharge ion source of the type disclosed by Leung I. It is noted, however, that a non-preferred embodiment disclosed in the prior art can properly be used as a prior art teaching. The use of a non-preferred embodiment would have been obvious to one willing to accept the drawbacks taught. See In re Boe, 148 USPQ 507; In re Mills, 176 USPQ 196 and In re Susi 169 USPQ 423.

Regarding the newly added limitation to claims 1 and 7 of "a positioning device for allowing a user to position at least one diamond sample in the path of the oxygen plasma exiting through the plasma source exit", Collins (see Fig. 3, for example) and Brailove (see Figs. 1 and 5, for example) have been added to the rejection to show that a plasma treating apparatus having a plasma source for treating a work-piece sample requires a positioning device for allowing a user to position the sample in the path of the

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plasma that exits the plasma source. It would have been obvious to one skilled in the art to provide a sample holder for the plasma treating apparatus of Leung I, in the manner illustrated by Collins or Brailove because a sample positioning device is required to successfully treat a work-piece as desired by Leung I.

Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leung I (5,198,677) taken in view of Kaufman (4,481,062) and Leung II (5,587,226) for the reasons stated in the rejection of claim 1 above, and taken in further view of Anderson (US Patent No. 5,365,070). Anderson teaches an ion source 10 (Fig. 1) including a magnetic holding metal member 12 made of carbon steel which has high magnetic permeability so that magnetic field can easily penetrate there through (column 5, line 47 through column 6, line 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize carbon steel in the construction of chamber having magnets there around so that magnetic field more efficiently penetrate there through.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leung I (5,198,677) taken in view of Kaufman (4,481,062) and Leung II (5,587,226) for the reasons stated in the rejection of claim 1 above, and taken in further view of Mantei (US Patent No. 4,483,737). Mantei teaches a plasma chamber 10 (Figs. 1, 2) including a filament 21 therein and having a plurality of magnets 14 surrounding the chamber wherein the plasma chamber 10 is made of a nonmagnetic material such as stainless steel (column 4, lines 29-56). Therefore, it would have been obvious to one of ordinary

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skill in the art at the time of the invention to utilize nonmagnetic stainless steel as a suitable material for a plasma chamber such as in Leung I.

The new matter rejection has been removed in view of applicants' amendments and accompanying arguments.

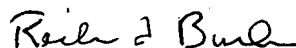
Applicants' arguments with respect to their newly added claim limitations have been considered and addressed by the new grounds of rejection stated above:

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Richard Bueker  
Primary Examiner  
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